

Resistor Power Rating Calculator

Evaluate resistor dissipation and a preliminary minimum wattage from the entered electrical values. Confirm the exact part's thermal, pulse, and maximum-working-voltage ratings before selection.

Generated October 10, 2026

<https://www.elecatrix.com/circuits-components/resistor-power-rating-calculator/>

Inputs

Input	Value	Unit
Calculation mode	Voltage and current	
Voltage	10	V
Current	0.5	A
Resistance	20	ohm
Allowable utilization	50	%
Selected rating	10	W

Results

Result	Value	Unit
Calculated dissipation	5	W
Minimum rating at entered utilization	10	W
Selected rating stress	50	%

Calculation mode
Calculation details

Detail	Value	Unit
Calculation basis	Power equals voltage multiplied by current. Minimum rating divides calculated dissipation by the entered allowable utilization.	
Rating boundary	Preliminary electrical stress estimate only. Verify continuous or pulse rating, maximum working voltage, temperature derating, package, thermal path, environment, and manufacturer data separately.	

Formulas

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$$P = V \times I$$

$$P = (V^2/R)$$

$$P = I^2 \times R$$

$$P_{\min} = (P/\text{allowable utilization\%} / 100)$$

$$\text{Stress\%} = \text{fracPP_selected} \times 100$$

Warnings and limitations

This is a preliminary resistor wattage estimate, not a part-selection approval. Verify the exact manufacturer derating curve, package, temperature, pulse or surge behavior, maximum working voltage, and thermal path.